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EFFECT OF BIDI TOBACCO DUST ON ROOT-KNOT NEMATODE (*Meloidogyne incognita*) ATTACKING OKRA

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ABSTRACT

Effect of bidi tobacco dust on root-knot nematode attacking okra cv. Parbhani Kranti showed that application of tobacco dust, 10 days prior to sowing (DPS), either at 1, 5 or 10 per cent significantly reduced the plant growth of okra indicating its adverse/toxic effect. However, it significantly reduced the root-knot disease and nematode multiplication compared to control. Increase in doses of tobacco dust further gradually reduced the growth of okra, root-knot disease and nematode multiplication.

KEYWORDS: Bidi Tobacco Dust, Root-knot Disease, Nematode Multiplication, Okra

INTRODUCTION

Plant parasitic nematodes are great menace in successful cultivation of many vegetable crops. Root-knot nematodes (*Meloidogyne* spp.) are the most common and found in most of the vegetable growing areas. Efficacy of tobacco extract or nicotine or nicotine sulphate against free living and plant parasitic nematodes are reported by some scientists in abroad and India (Miller *et al.*, 1973; Krishnamurthy and Murthy 1990). However, information's on efficacy of bidi tobacco dust, left out waste material of tobacco, as such on root-knot nematode (*Meloidogyne incognita*) attacking okra is lacking. Therefore, present investigation was carried out.

MATERIALS AND METHODS

An experiment was carried out in earthen pots,15 cm diameter, filled with sterilized pot mixture (500 cc sterilized soil and FYM) along with bidi tobacco dust @ 0, 1, 5 and 10 per cent repeated five times in CRD. Each pot was watered in the morning and inoculated in the afternoon with the juveniles of root-knot nematode @ 3000 J_2 per pot. The seeds of okra cv. Parbhani Kranti were seeded @ 3 per pot 10 days after nematode inoculation. Each pot was thinned down upon germination to keep one plant per pot. The pots were kept on net house bench. Every day, the pots were examined and watered, if required, till the termination of experiment. Proper plant protection measures with respect to fungal diseases and insects were also taken. Fifty days after planting the pots were uprooted and observations were recorded on plant growth and nematode multiplication.

RESULTS AND DISCUSSIONS

Perusal of data presented in Table 1and 2 on effect of bidi tobacco dust on root-knot nematode attacking okra revealed significant differences among the treatments for all the characters studied.

Application of tobacco dust 10 DPS @ 1, 5 and 10 per cent significantly reduced plant height, fresh and dry shoot weight as well as fresh root weight compared to control. It was recorded maximum and significantly the highest in control.

Increase in dose of tobacco dust from 1 to 10 per cent gradually reduced all these growth characters with the highest reduction in 10 per cent. All the three doses differ significantly from each other. This showed adverse effect of tobacco dust on okra.

The data presented in Table 2 on root-knot index revealed that application of tobacco dust, 10 DPS, @ 1, 5 and 10 per cent significantly reduced root-knot index compared to control. Increase in quantity of tobacco dust gradually reduced the root-knot index with minimum in the highest dose of 10 per cent. Both the lower doses of tobacco dust i.e. 1 and 5 per cent were at par with each other and significantly different from the highest dose. Maximum root-knot index (4.60) was observed in control and was significantly different from the remaining treatments of tobacco dust.

The results on number of females per plant revealed that application of tobacco dust significantly reduced the number of females per plant compared to control. All the treatments differed significantly from each other with the maximum and minimum number of females in the treatments of control and 10 per cent tobacco dust, respectively.Increase in dose of tobacco dust starting from 1 to 10 per cent significantly and gradually reduced the number of females per plant. Similar trend was number of egg masses per plant. The results were non significant for number of eggs per egg mass indicating no effect of tobacco dust on them.

Perusal of data presented in Table 2 indicated that application of tobacco dust @ 10 per cent significantly reduced the soil population compared to rest of the treatments. Though the treatments of 1 and 5 per cent tobacco dust reduced the soil population than control but they were at par with control.

The above results clearly indicated that application of tobacco dust, 10 DPS, either at 1, 5 or 10 per cent significantly reduced the plant growth of okra indicating adverse/toxic effect of tobacco dust. This may be due to insufficient time of only 10 days to decompose the tobacco dust. However, application of tobacco dust 10 DPS significantly reduced the root-knot disease and nematode multiplication compared to control. Adverse effect of application of tobacco dust, 10 DPS, on germinating bidi tobacco seeds and transplants as well as reduction in root-knot disease and nematode multiplication was also observed by us in our another studies. Increase in doses of tobacco dust further gradually reduced the growth of okra, root-knot disease and nematode multiplication. The nematicidal action of nicotine and organic acids are very well reported by several scientists (Davis and Rich, 1987; Rich *et al.*, 1989; Yu and Potter, 2008; Desai *et al*., 1972). Our results are akin to the results of Sharma and Patel (2001), who reported cured leaf extract of bidi tobacco (1 or 10 per cent) significantly reduced root-knot disease, larval penetration as well as nematode multiplication in okra. The results observed in present study are in confirmation with the results reported by Khan *et al.* (1997), Fathi and Eshtianghi (2001), Motha *et al.* (2010) and Olabiyi *et al.* (2011). On the basis of above findings, in future, investigations on decomposition period of tobacco dust with respect to bidi tobacco and other vegetable crops, C:N ratio of tobacco dust applied treatment, effect of tobacco dust on other soil microbes etc. can be made for practical utility of tobacco dust/waste in nematode management.

CONCLUSIONS

The results on this experiment concluded that effect of bidi tobacco dust on root-knot nematode attacking okra cv. Parbhani Kranti showed that application of tobacco dust, 10 DPS, either at 1, 5 or 10 per cent significantly reduced the plant growth of okra indicating its adverse/toxic effect. However, it significantly reduced the root-knot disease and nematode multiplication compared to control. Increase in doses of tobacco dust further gradually reduced the growth of

okra, root-knot disease and nematode multiplication.

Table 1: Effect of Bidi Tobacco Dust on Root-knot Nematode (*M. incognita)* Attacking Okra: Effect on Plant Growth Characters

Treatment (%)	Plant Height, cm	Shoot Weight, g		Fresh Root Weight, g
		Fresh	Dry	
1	**20.40**	**7.64**	**1.52**	**1.80**
5	**18.00**	**4.75**	**1.04**	**1.23**
10	**15.20**	**3.13**	**0.46**	**1.00**
Control	**26.20**	**11.77**	**3.13**	**2.28**
S.Em. ±	**1.08**	**0.54**	**0.11**	**0.10**
CD 0.05	**2.29**	**1.15**	**0.24**	**0.21**
CV%	**8.57**	**12.60**	**11.44**	**10.11**

Table 2: Effect of Bidi Tobacco Dust on Root-knot Nematode (*M. incognita)* Attacking Okra: Effect on Nematode Infection and Multiplication

Treatment (%)	Root-knot index (0-5)* Log (X+1)	Numbers/plant		No. of eggs/ egg mass (Av. of 5 egg mass) Log (X+1)	Soil population 500 cc soil Log (X+1)
		Female Log (X+1)	Egg mass Log (X+1)		
1	0.53 (2.40)	1.45 (29)	1.08 (12)	2.43 (269)	3.31 (2200)
5	0.44 (1.80)	1.04 (11)	0.74 (5)	2.42 (273)	3.03 (1100)
10	0.18 (0.60)	0.37 (2)	0.31 (1)	2.40 (256)	1.62 (350)
Control	0.75 (4.60)	1.81 (72)	1.45 (29)	2.35 (225)	3.58 (4000)
S.Em.±	0.06	0.15	0.12	0.06	0.48
CD 0.05	0.13	0.33	0.26	NS	1.02
CV%	21.08	20.93	21.56	4.22	26.27

*0= Free; 5= Maximum disease intensity
Figures in parentheses are original values.

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